

WHAT IS CLAIMED IS:

1. A clean box comprising:
a box body having an opening in a bottom;
a lid member for closing said opening;
5 an annular groove formed so as to surround said
opening on at least one side of said box body or said
lid member to define a suction space sealed between
said lid member and said box body under the condition
that said lid member is mounted on said box body; and
10 on intake/exhaust port for allowing vacuum
exhaust/release of said annular groove from the
outside.

2. A clean box according to claim 1, further
15 comprising a valve provided on said lid member for
allowing gas to be introduced and discharged for
replacement of the gas within an interior of the clean
box.

20 3. A clean box according to claim 1, further
comprising a mechanical latch for preventing said lid
member from falling apart from said box body.

25 4. A clean box according to claim 3, wherein said
mechanical latch has a mechanism for opening/closing
said latch from the outside on the side of said lid
member.

5. A clean box according to claim 2, wherein said intake/exhaust ports and said valve are provided together on the same side surface of said box body.

5 6. A clean transfer method using a clean box comprising: a box body having an opening in a bottom; a lid member for closing said opening; an annular groove formed so as to surround said opening on at least one of said box body and said lid member to define a suction space sealed between said lid member and said box body under the condition that said lid member is mounted on said box body; and an intake/exhaust port for allowing vacuum exhaust/release of said annular groove from the outside, comprising the steps of:

10 15 disposing the clean box, sucked by vacuum discharging said annular groove, on a load port of a clean device whose interior is kept under a clean environment and having a box lid opening/closing mechanism for opening/closing the lid member of the clean box, so that said lid member and the box lid opening/closing mechanism on the side of the load port are aligned to confront with each other with said lid member facing downward;

20 25 releasing vacuum in the suction space through said intake/exhaust port by a mechanism for releasing the vacuum provided on the load port to thereby open said lid member; and

picking up an article to be transferred within the clean box and moving the article to the clean device.

7. A clean transfer method according to claim 6,
5 further comprising the steps of:

closing said lid member of the clean box by said
box lid opening/closing mechanism after the article to
be transferred that has been subjected to a process in
the clean device has been returned back to the clean
10 box; and

evacuating the suction space through a gas exhaust
mechanism provided on the load port to suck together
said lid member and said box body.

15 8. A clean transfer method according to claim 6,
wherein said clean box has a valve for allowing gas in
the interior of said box to be replaced, the method
further comprising the steps of returning back to the
clean box the article to be transferred that has been
20 subjected to the process in the clean device, closing
the lid member of the clean box, and performing the
replacement of gas in the space of the interior of the
clean box through the valve after the suction space is
evacuated through said gas discharge mechanism so that
25 the lid member and the box body are sucked together.

9. A clean transfer method according to claim
6, wherein said clean box has a mechanical latch for
preventing the lid member from falling apart from the
box body, and said box lid opening/closing mechanism
5 releases the mechanical latch before the release of
vacuum of the suction space.

10. A clean transfer method according to claim 9,
wherein the mechanical latch is effected after the
10 suction space has been evacuated so that the lid member
and the box body have been sucked together, after the
article to be transferred that has been subjected to
the process in the clean device has been returned back
to the clean box.

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11. A clean transfer system comprising:
a clean box comprising: a box body having an
opening in a bottom; a lid member for closing said
opening; an annular groove formed so as to surround
20 said opening on at least one of said box body and said
lid member to define a suction space sealed between
said lid member and said box body under the condition
that said lid member is mounted on said box body; and
an intake/exhaust port for allowing vacuum
25 exhaust/release of said annular groove from the
outside, and

a load port of a clean device whose interior is kept under a clean environment and having a box lid opening/closing mechanism for opening/closing the lid member of the clean box,

5 wherein said clean box is disposed so that said lid member and the box lid opening/closing mechanism on the side of the load port are aligned to confront with each other with said lid member downwardly, and
 said load port has a device for vacuum
10 exhausting/releasing said suction space through said intake/exhaust port of the clean box.

12. A clean transfer system according to claim
11, wherein said clean box has a valve device for
15 allowing gas to be introduced and discharged for
 replacement of the gas in said clean box.

13. A clean transfer system according to claim
12, wherein said valve device comprises a gas input
20 valve for introducing a non-oxidizing gas into the
 interior of the clean box and a gas output valve for
 discharging the gas within the clean box to the
 outside.

25 14. A clean transfer system according to claim
 12, wherein said load port has a means for replacement

of gas in the interior of the clean box in cooperation with said valves device.

15. A clean transfer system according to claim
5 13, wherein said load port has a gas feed deivce in cooperation with the gas input valve and a gas discharge device in cooperation with the gas output valve.

10 16. A clean transfer system according to claim
14, wherein said intake/exhaust port and said valve device are provided on the same single side surface of the clean box body, and the device for vacuum exhausting/releasing and the device for replacement of
15 the gas in the interior of the clean box are constituted as a single unit so that the clean box may be accessed by one operation.

17. A clean box comprising:
20 a box body having an opening in one surface thereof;
a lid member for closing said opening;
an annular groove formed so as to surround said opening on at least one of said box body and said lid
25 member to define a suction space sealed between said lid member and said box body under the condition that said lid member is mounted on said box body; and

an intake/exhaust port for allowing vacuum exhaust/release of said annular groove from the outside, formed on said lid member.

5 18. A clean box according to claim 17, further comprising a valve device for allowing the gas to be introduced or discharged for replacement of gas in the interior of the clean box is provided on the lid member.

10 19. A clean box according to claim 17, further comprising a mechanical latch for preventing the lid member from falling apart from the box body.

15 20. A clean box according to claim 19, wherein said mechanical latch has a mechanism for opening/closing said latch from the outside on said lid member side.

20 21. A clean transfer method using a clean box comprising: a box body having an opening in a bottom; a lid member for closing said opening; an annular groove formed so as to surround said opening on at least one of said box body and said lid member to define a suction space sealed between said lid member and said box body under the condition that said lid member is mounted on said box body; and an intake/exhaust port

for allowing vacuum exhaust/release of said annular groove from the outside, formed on the lid member, comprising the steps of:

- disposing the clean box, sucked by vacuum
- 5 discharging said annular groove, on a load port of a clean device whose interior is kept under a clean environment and having a box lid opening/closing mechanism for opening/closing the lid member of the clean box, so that said lid member and the box lid
- 10 opening/closing mechanism on the side of the load port are aligned to confront with each other;

releasing vacuum in the suction space by a box lid opening/closing mechanism on the load port through said intake/exhaust port provided on the lid member of the

15 clean box to thereby open said lid member; and

picking up an article to be transferred within the clean box and moving the article to the clean device.

22. A clean transfer method according to claim
- 20 21, further comprising the steps of:

closing said lid member of the clean box by said box lid opening/closing mechanism after the article to be transferred that has been subjected to a process in the clean device has been returned back to the clean

25 box; and

evacuating the suction space through said intake/exhaust mechanism to suck together said lid member and said box body.

5 23. A clean transfer method according to claim
21, wherein said clean box has a valve for allowing gas
in the interior of said box to be replaced, the method
further comprising the steps of:

10 returning back to the clean box the article to be
transferred that has been subjected to the process in
the clean device;

15 closing the lid member of the clean box; and
 performing the replacement of gas in the interior
of the clean box through the valve after the suction
space is evacuated through said intake/exhaust
mechanism so that the lid member and the box body are
sucked together.

20 24. A clean transfer method according to claim
21, wherein said clean box has a mechanical latch for
preventing the lid member from falling apart from the
box body, said box lid opening/closing mechanism
releases the mechanical latch before the release of
vacuum of the suction space.

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 25. A clean transfer method according to claim
24, wherein the mechanical latch is effected after the

suction space has been discharged and the lid member
and the box body have been sucked together, after the
article to be transferred that has been subjected to
the process in the clean device has been returned back
5 to the clean box.

26. A clean transfer system comprising:
a clean box comprising: a box body having an
opening in one surface thereof; a lid member for
10 closing said opening; an annular groove formed so as to
surround said opening on at least one of said box body
and said lid member to define a suction space sealed
between said lid member and said box body under the
condition that said lid member is mounted on said box
15 body; and an intake/exhaust port for allowing vacuum
exhaust/release of said annular groove from the
outside, formed on said lid member, and

a load port of a clean device whose interior is
kept under a clean environment and having a box lid
20 opening/closing mechanism for opening/closing the lid
member of the clean box,

wherein said clean box is disposed so that said
lid member and the box lid opening/closing mechanism on
the side of the load port are aligned to confront with
25 each other with said lid member facing downward, and
said box lid opening/closing mechanism of the load
port releases the vacuum of the suction space through

said intake/exhaust port formed on said lid member of the clean box, opens said lid member, and picks up an article to be transferred in the interior of the clean box.

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27. A clean transfer system according to claim 26, wherein said box lid opening/closing mechanism closes the lid member of the clean box after the article to be transferred that has been subjected to a process in the clean device has been returned into the interior of the clean box, and said lid member and said box body are sucked together by evacuated the suction space through said intake/exhaust mechanism.

15 28. A clean transfer system according to claim 26,

wherein: said clean box has a valve for allowing the gas in the interior of the clean box to be replaced; and said load port further comprises gas replacement device for replacing the gas in the clean box through said valve, and

wherein:

25 said box lid opening/closing mechanism returns back to the clean box the article to be transferred that has been subjected to the process in the clean device, and closes the lid member of the clean box; and

the replacement of the gas in the space in the
interior of the clean box is replaced through the valve
after the suction space has been evacuated through said
intake/exhaust mechanism so that the lid member and the
5 box body are sucked together.

29. A clean transfer system according to claim
26,

wherein: said clean box has a mechanical latch for
10 preventing the lid member from falling apart from the
box body; and said box lid opening/closing mechanism
further comprises a latch opening/closing mechanism for
opening/closing the latch from said lid member side,
and

15 wherein the mechanical latch is released before
the release of the vacuum of the suction space by said
latch opening/closing mechanism.

30. A clean transfer system according to claim
20 29, wherein said latch opening/closing mechanism
effects the mechanical latch after the suction space
has been evacuated and the lid member and the box body
have been sucked together, after the article to be
transferred having been subjected to a process in the
25 clean device is returned back to the clean box.